resistant zone which, if the contents are evacuated, persists as an indurated ring. Ulcerations rarely supervene unless the abscess is incised. An astonishing feature is that large numbers of such lesions may exist with scarcely any effect upon the general health.

The ulcerated forms go through similar stages but ulcerate more or less rapidly. Often the ulcers begin as narrow, fistulous openings. The edges are ragged and the aspect may closely resemble a tuberculous ulcer. The clinical diagnosis is made by the contrast between the great number of lesions and the good general health of the subject, the onset with indurated nodes which slowly progress to suppuration, by the irregular borders which may cover the cavity in which pus accumulates, by the narrowness of the ulcer in contrast with the extent of the gummatous infiltration, by the coexistence of several openings from the same gumma with the persistence between two ulcers of a fine bridge of violaceous skin, by the facility of auto inoculation and by the usual absence of adenopathy.

The diagnosis by direct microscopic examination of pus is possible but difficult. Much easier is the diagnosis by cultural methods for the cold culture on Sabouraud's special medium gives a characteristic growth.

THROMBOSIS OF THE LATERAL SINUS WITH REPORT OF FIVE CASES.*

By CULLEN F. WELTY, M. D., San Francisco.

In a report of five cases of sinus thrombosis, it will be interesting to note that it covers a series of 300 mastoid operations. This fact alone should attract your attention, because this small percentage of operated cases had sinus thrombosis, or were followed by the same. The reason for this is that serious complications were not allowed to develop under the guise of conservatism. Cases were operated early, and the more serious complications avoided.

Three cases of sinus thrombosis were from acute suppurative otitis media in a series of 100 acute mastoid operations.

Two of the cases were from chronic suppurative otitis media in a series of 200 radical mastoid operations.

So you can readily understand that you are much more liable to the more serious infections in acute otitis media than in the chronic cases because of the immunity that is established by the chronic process.

You will not find recorded in the literature such a small percentage in a series of operated cases—and the reasons are quite obvious.

Another very important fact and probably the most important, the cases all recovered. The recovery was not dependent upon delay, coming to a conclusion based upon bacteriological examination or other procedures that have assumed an important role in diagnosis, but upon more mature surgical judgment. At times, it may be necessary to uncover the sinus, or open the sinus. Such surgical interference in my hands has never been followed by infection; while I am doubly sure that delay will cost your patient more serious trouble.

Case I. S., male, 75 years of age. Medical history by Dr. H. C. Moffitt. Father and mother died in old age. Mother at 70 from malaria. No severe sickness in family. Patient has always been well. No pneumonia or typhoid. Was in the army and had a sword wound in the left parietal. Had had malaria. Denies specific history. Five months ago had acute suppurative otitis of the left ear. Has had headache over this side of the head ever since. At times it is very severe. The severe spells come every third day and are increasing in severity. Pain only on this side of the head. Memory failing. Hearing gone in left ear. Pain in left occiput running down neck. Appetite is poor at times due to nausea. Has no vomiting spells. Bowels regular, urine negative. Has noted laryngeal cough from fluid discharged in the pharynx. Has no dizziness. Has lost forty pounds in four months. Tenderness at back of neck when pain is felt. Has had to take morphine constantly for the last two months. No temperature or chills.

Examination: Pale, emaciated, evidently in much pain. Holds head stiff. Cannot bend it forward without much pain. Tenderness over the upper three vertebrae. A little swelling a little to the left of the upper three vertebrae as well as back of the mastoid. Most tender between mastoid and vertebrae and on deep pressure is felt a swelling that feels partly periostial and partly of the soft parts. Along the anterior and the posterior borders of the mastoid, are glands dwindling from above downward; the largest, the size of a bean, somewhat tender. Pain along left jugular, but no tenderness. Pulse in jugular. Pupils small from morphine, but react to light and accommodation. No nystagmus. Fundus not examined. Skull not tender. No facial nor trigeminus. No change in reflexes. No swelling of vertebrae from the mouth. Examination of the nasal pharynx leads to discharge of a considerable quantity of pus.

Probable diagnosis: Extra dural abscess; sarcoma in the posterior fossa; necrosis of the Atlas or a sinus affection.

Ear examination by myself: The ear stands out from the temporal bone more than the ear on the opposite side. This ear is hot in comparison with the ear on the opposite side. Some swelling of the mastoid but particularly back of the mastoid. Sensitive over the whole of the mastoid, but especially back of the mastoid. Some pain down the side of the neck. The pus is small in quantity and very offensive. There is decided bulging of the posterior superior wall. A small perforation in the tympanic membrane. Weber in bad ear. Schwabach lengthened. Speech on contact in this ear.

September 15, 1915, radical operation. Started to do the operation for acute mastoiditis; however, I changed it into a radical operation, because the pathologic findings were so extensive that I thought it could not be thoroughly removed without the latter procedure. Pus under the periosteum. The perforation was near the tip of the mastoid. On the removal of bone, pus and granulation tissue welled into the cavity uncovered. The individual cells were largely destroyed and instead a large cavity was present. In curetting away the granulation tissue, I suddenly encountered more pus under considerable tension. After further curettement, I was able to demonstrate that this latter pus was in the sinus and separated from the pus in the mastoid by granulation tissue. I curetted the jugular end of the sinus as far as my curette would go and packed with iodoform

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gauze. The other end of the sinus was nicely sealed and the patient had no symptoms of pus infection, so the clot was not disturbed. The jugular was not ligated for the same reason. The only explanation that can be offered for this is that of a pneumococcus infection. Docent Dr. Alexander of Vienna reports a similar case about two years ago, saying that he had made a thorough search of the literature and was unable to find a similar case on record.

The patient made an uninterrupted recovery. He did not have any chill, fever or sweat during his illness.

Case II. Male, age 33, machinist by occupation. Had ordinary diseases of childhood. Has never been ill that he can remember. On January 21, 1907, was slightly under the influence of alcohol, fell striking the back of his head. Says that he was somewhat dazed for a time and noted that he had a discharge of blood from the right ear. The following day noted a serous discharge from the ear and that it was tinged with blood. Also that he could not hear as well from this ear as formerly. Three days following the injury had a chill and some fever. Some pain in the ear and some pain in the mastoid region. This subsided gradually during the course of ten days. He returned to work for a short time, when he again had pain and tenderness back of the ear. Stopped work for three or four days and again felt quite well. This fever, pain and tenderness has continued uninterruptedly for the last six weeks. Three days following the accident pus began to discharge from the ear and it has continued up to the present time and is of very offensive odor. There has always been more or less pain confined to this side of the head, at times much more intense. Of late the pain is increasing in severity and occurring much more frequently. For some days past, says he has had fever. No chills or chilly sensations.

Ear examination: No swelling of the soft parts about the mastoid. No increased surface temperature. Slight tenderness over the whole of the temporal bone. Very sensitive over the tip of the mastoid. There is an offensive discharge from the small perforation below the end of the hammer. The tympanic membrane was bulging to such an extent that the landmarks were completely obliterated. The bulging of the posterior superior wall was so marked that it helped to obliterate the membrane. Temperature 102.5°, pulse 110. Operation recommended.

As the following day was Sunday, we did not operate until Monday, his temperature remaining near 103° the whole of the time.

Acute mastoid operation. Nothing of note on removal of the periosteum. After removing the outer shell of the mastoid, a blood clot was found that was partly broken down and intermingled with pus. The clot began back of the posterior osseous wall of the meatus, extending horizontally across the mastoid to the wall of the sigmoid sinus. On the removal of the blood clot, granulations, tissue and pus, the fracture could be traced through the posterior osseous wall of the meatus, crossing the mastoid, fracturing and uplifting that part of the mastoid that covers the sinus; between the sinus and the broken bone there was pus and new organized connective tissue covering part of the sinus wall. The sinus was uncovered until it appeared perfectly healthy. There was pulsation in the sinus and it was compressible. The balance of the mastoid cells and the cancellous tissue was removed and the antrum opened freely and the operation completed.

The temperature did not drop as was expected. Wound dressed the second day following operation. No pus in the external meatus. Everything looking well in the mastoid wound. The third day the temperature remained about the same. I decided the sinus should be explored the following morning. When I called on the fourth day, the temperature had fallen considerably and the patient was feeling comfortable. I decided to postpone further operative procedure. In less than half an hour after my visit, the patient had a chill and the temperature went to 104°. During the fifth day, the patient began to experience pain in the right knee, which was bandaged and hot applications applied. The following day, six days after first operation, I decided to open the sinus. The new granulation tissue was curetted away; all parts made clean as possible; pulsation could be felt in the sinus. Besides, it was compressible. There was no pain along the jugular at any time. The lateral sinus was freely incised. The proximal end on the sinus did not bleed as much as the distal end. At any rate I concluded that there was a partial thrombus and I curetted and packed with iodoform gauze. The distal end was plugged without curettement. The jugular was ligated and the operation completed. The following day the patient had a chill and a temperature of 104°. The same day the knee was punctured and the secretion showed to contain a pure culture of streptococcus. The knee was freely opened the same day. There was considerable bloody pus found. There was a decided fall in temperature that followed this operation, followed by another rise in the temperature about two days following this knee operation. I account for this by the fact that the mastoid wound had not been dressed for three days. There was a gradual fall following this dressing.

Dr. Alvarez has done some bacteriological work for me on this case, of which I wish to speak, and has furnished me with the following data: Arneth and others have recently been studying the polymorphonuclear neutrophiles and find that the number of nuclei vary considerably under different conditions and in different diseases. There are five classes of cells, with one, two, three, four and five nuclei respectively; the percentage of the classes and the average number of nuclei to a cell vary. Normally the count varies only slightly from the following:

I	II	III	IV	V
5	35	41	17	2

Average number per cell, 2.76.

The polymorphonuclear neutrophiles are supposed to develop from a small cell with single oval nucleas. A few of these are normally found in the blood. The older the cell presumably the more neuclei it has, and the older cells are supposed to be most active in the phagocytosis. If this be true, a large percentage of multinucleate cells would give a good prognosis, as the person should be more resistent to infections. This seems to be borne out clinically, but an immense amount of research must yet be done. A bad prognosis might have been given in Dr. Welty's case with pus and streptococci in the knee joints, but the differential neutrophile count showed the following percentages:

I	II	III	IV	V
4	24	34	25	13

Average number, 3.19.

As the average number seldom goes over three, the prognosis for this count was good. This was borne out subsequently. Probably the circulating streptococci had been destroyed very quickly.

Case III. Male. Age 32. Discharge from left ear since childhood. Has had pain back of the ear quite a number of times. Never so severe as at the present time. This pain began about three days ago and has been increasing in severity from day to day. With each attack of pain has had more or less vertigo; during this last attack there is so much vertigo that at times he must assume the recumbent position.

Three days ago had a severe chill and perspired

freely following; had a second chill that day. Took heavy doses of quinine on the advice of his doctor; following day much better, very little pain, no vertigo. Following day or the third day of this attack, had another chill, temperature and perspiration. He was operated late that evening.

Operative findings: Large pneumatic mastoid, large individual cells had all been destroyed, the tip of the mastoid had been perforated. The dura of the posterior fossa was uncovered by caries and looked healthy. The wall of the sinus was covered by large granulations. The granulations were cut away with a scissor.

The usual plastic, wound left open for further observation. The following day had a temperature of 105.2°, and a chill that was very severe. This same evening he was again anesthetized, the jugular ligated and a long incision made in the sinus; there was a well organized clot that seemed to have areas that were broken down, and in such places there was a sero-sanguinous pus present.

It was difficult to get bleeding from the proximal end, because the clot extended so deep, and from the fact that the jugular was ligated from below, so the only bleeding that could come would be from the superior petrosal. In many instances this vein carries a thrombus. After persisting for some time there was free bleeding. The clot in distal end was destroyed at once. After tamponing either end very completely that part of the sinus that was incised was examined carefully. There was an ulcerating area, the size of a silver five-cent piece; this was curetted very carefully, packed with iodoform gauze. Packing remained in four days. The following day the temperature fell to normal and remained so. In 12 weeks the patient had entirely recovered, with a useful ear.

Case V. Male, age 22. Discharge from ear since childhood. Two years ago began to have spells that were likened to "petit-mal"; these continued with increasing severity until eight weeks ago, when he developed "grand-mal." During the last eight weeks he has had these attacks, frequently will be unconscious, and at times confined to his bed from 12 to 24 hours.

Examination: Foul offensive discharge—masses of epidermis protruding from the rather large perforation of the attic wall; nystagmus to opposite side. Labyrinth, intact, hypersensitive to caloric reaction.

Conclusions: The attacks spoken of were none other than mild attacks of vertigo to start with, which increased as the caries progressed, producing the intense attacks of vertigo in which he would lose consciousness. When we introduced cold water into the ear he had an intense reaction. I asked him at the time if it was similar to those which he had experienced; he said it was, only the attacks were much more severe.

Deductions: That he had a fistula of the horizontal semi-circular canal. There was no fistula symptom.

Operative findings: The sinus was uncovered by the first stroke of the chisel, the attic and antral wall covering the cura were largely destroyed by caries so that the dura was uncovered from in front, the entire middle fossa, posterior fossa and the whole of the sinus. There was no fistula of the horizontal canal, but caries extended deep into the petrous portion of the bone. Grafts were applied over bone surface only, and wound closed in the usual manner.

First day after operation, some temperature; second day, more temperature; fourth day after operation, temperature, 102.4°. Thought the change of dressing would reduce temperature; fifth day after operation, temperature 103.2°, and a chill; sixth day, temperature 104.2°.

The following morning opened the lateral sinus, finding a small mural clot. The jugular was not ligated because the clot was small and confined to a definite area of the sinus. The patient has not had any temperature since. Made an uninterrupted recovery.

Case IV. Male, age 20. Five weeks ago had acute otitis; pain more or less severe, which lasted for about two weeks. The ear continued to discharge but gave him no pain for the following week. For the past week he has had pain on this side of the head, and in the back of the head. Two days ago had his first attack of vertigo. To-day has more or less vertigo all the time. Has had no chill or temperature that he noticed.

Examination: Patient looks septic; no fever, slight facial paralysis, pupils react to light and accommodation. Spontaneous nystagmus to the opposite side. Painful on superficial pressure on this side of the head, more so over tip and back of same. Meatus almost swollen shut, foul offensive discharge, bleeding granulations, labyrinth intact.

Operative findings: Large pneumatic mastoid, all broken down, sinus uncovered by caries and bathed in pus. A dark colored spot the size of a silver five-cent piece presented. Incision was made in the sinus at this place and a large clot removed, only after curetting at some distance from either end did I encounter free bleeding. Both ends were well packed with iodoform gauze. Uninterrupted recovery.

In this series of five cases, we find that two are the outcome of chronic suppurative otitis media, and three follow acute suppurative otitis media.

Naturally, the first thing to attract your attention is the fact that all the cases had been neglected, or rather allowed to go along until the more serious symptoms presented. Had either one or all of them been operated when they should have been, they would not have had these serious complications.

In the case with an embolus to the knee joint, this latter condition was produced by delay in further operative procedure. This man would be free from temperature for as much as 48 hours at a stretch. The time of operation was fixed on two different occasions and was delayed because the patient was apparently in such good condition. He was finally operated; a few days following operation, thrombus to the knee. This was punctured and then incised, some stiffness remaining. His temperature continued for some three weeks, dropping daily by a fraction of a degree. The reason for this was again the delayed operation. Under the guise of conservative ear surgery, the man's life was almost sacrificed. This was my first case. I am sure I will not be so remiss again.

The third case demonstrates good judgment in the surgical procedure. The only faulty part was that the sinus should have been uncovered, and if it did not look healthy should have been incised.

The first and fourth cases were very much alike —in this that they had no temperature or chill during their illness. In the first case, the sinus was in connection with the mastoid cavity, filled with fluid pus which was under considerable pressure. Either end of the sinus was sealed nicely, and as the patient was not suffering with a septic process, further interference was unnecessary.

In the fourth case, there was a dark discoloration of the sinus about the size of a silver five-cent piece. The sinus was incised, exposing the clot.

For the same reason as in the other case, the jugular was not ligated.

Some three years ago Ruttin of Vienna searched the literature for such cases, and was only able to collect seven. My two cases were not included. From the reported cases, we must conclude that it is a rare condition; however, I am of the opinion that many such go unrecognized. This latter statement is borne out by a former city coroner of San Francisco, who found several cases of healed sinus thrombosis, that had died of other causes. While what I have said I believe to be true, no ear surgeon of any experience whatsoever would have done less. Many would have ligated the jugular in all the cases. It is for this reason that I repeat these cases more or less in detail to show you why such a procedure is entirely uncalled for.

The fifth case is again unusual as was shown by the temperature curve, not until the day before operation could I conclude that it was a sinus thrombosis. In fact, from the temperature chart, one would think more of meningitis than of sinus thrombosis. Again, he had considerable edema about the ear that made it look very much like erysipelas; besides, the temperature was in keeping with erysipelas, until he had his chill and remission. The findings have been reported before.

Conclusions in regard to the case: I believe that there was a surgical injury of the dural wall covering the sinus, at the time of operation, and that from this injury the infection took place; this would be in keeping with the temperature chart—an increasing infection with daily increase of temperature. In a labyrinth operation I accidentally opened the sinus, but there were no ill effects. In three instances, I have incised the sinus for diagnostic purposes. In none of the cases did I have infection to follow.

The jugular was not ligated in this case because I discovered a small mural clot with free bleeding from either end, and again because the general infection was so slight that it would be taken care of in other ways. This again was clearly demonstrated by the temperature chart.

I believe that everything possible should be done for an individual case to establish a diagnosis beyond a question of doubt. At the same time; cases do present where delay would only produce further serious complications; which is well illustrated by the second case that was followed by embolus to the knee and a temperature that lasted for some three weeks. Had I been more firm in my convictions, I am confident the patient would have been spared many days of anxiety, besides an impaired knee joint.

The cases in question were so definite, precise and well established on the one side that further observation was entirely unnecessary; on the other side it is very serious to the life of the individual to delay if such is the case. I believe that in a given number of cases, one side worked out thoroughly from a bacteriological standpoint, the diagnosis established in this way will cost such a loss of time and more serious complications with greater mortality, than by exposing the sinus and incising in suspected cases.

This is at variance with the best teaching of otology of to-day. Nevertheless, my belief is based upon actual observations which are very convincing.

THREE CASES OF PELLAGRA IN SAN FRANCISCO.

By JULES B. FRANKENHEIMER, M. D., San Francisco.

Five years ago, pellagra was a little known disease in the United States, today there are estimated about 60,000 cases. From an infected area in a group of Southeastern states the disease has spread to the North and to the West; in fact so far West that California must now acknowledge the disease within her boundaries.

In the CALIFORNIA STATE JOURNAL OF MEDICINE for November, 1912, Podstata and Willhite of Livermore have reported three cases of pellagra. The reader is referred to their paper for historic details, etc. While in these cases reported by Podstata and Willhite, the mental symptoms were a predominant feature; in the cases which the writer saw recently they were not so conspicuous. Therefore it seems justifiable to report these cases as showing a type of the disease in which the mental symptoms are not the most striking ones.

That the disease is increasing rather rapidly is evidenced by the fact that the writer within the last two months has seen two cases other than those here reported.

In order not to weary the reader with a too detailed history and physical examination, only those facts bearing on this disease will be noted. The mental condition of the patients has made it difficult to get accurate answers to tests in examining the nervous system.

S. P., a German, 50 years of age, sailor by occupation, came to the hospital on April 11, 1913, complaining of pains in the legs and ankles. His family history as to the disease under discussion is negative. Since 1897 he has resided in San Francisco, except during the time of his voyages to the Philippines in the transport service. He denies venereal disease.

Pellagrous Symptoms: At the time of entrance the dorsum of either hand was the seat of erythema which extended on to the wrist as far as the "cuff-line." On the bridge of the nose and extending on to the cheeks was a small, slight butterfly-shaped erythema. His tongue was reddened, particularly along the edges.

The condition of the reflexes was as follows:

Eyes react to light and accommodation.
Biceps and triceps jerks exaggerated.
Abdominal present.
Patellar exaggerated.
Achilles absent.
Babinski absent.

Mentally the patient was apathetic—there was no confusion.

The sensory changes were difficult to determine; there was an indefinite confusion of heat and cold on the abdomen and upper thighs. There was an indefinite hypalgesia on the legs.

T. R., an American, aet. 59 years, a sailor by occupation, came to the hospital on account of falling unconscious on the street. He resided in Virginia from the 18th to 20th year, and from that time until the present in San Francisco. He has been at sea a great deal, but the last three years have been spent as a longshoreman. His family